

GENERAL MOTORS



## **Environmental Stewardship Activities**

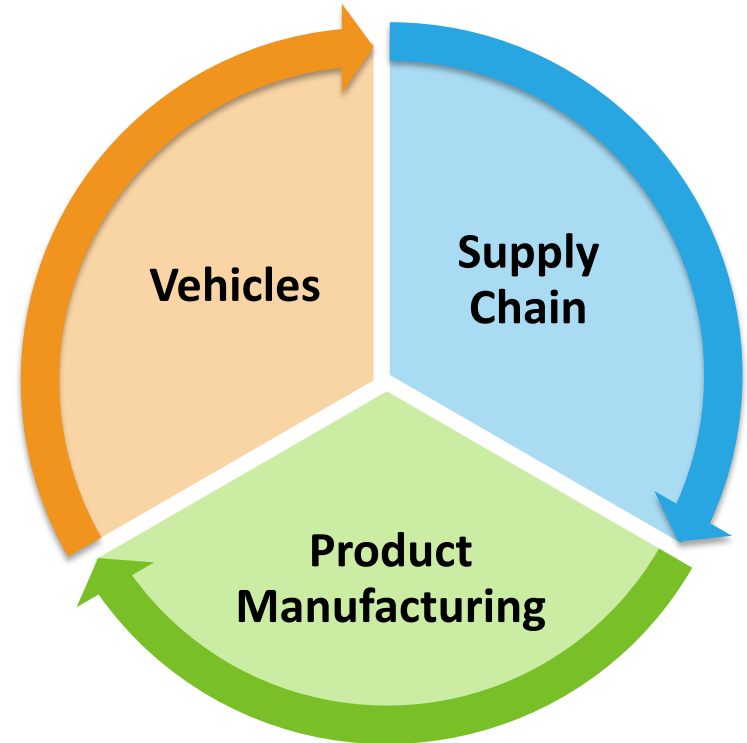
Dale Beal (GM Kokomo) and Matt Emery (GM Marion)

September 29, 2015

# Environmental Commitment

*We're continually assessing our **environmental impact** and taking steps to **reduce it***

GM has a commitment to the environment and sustainability that applies to every part of our business – from our **supply chain**, to **product manufacturing**, to the **vehicles** we put on the road.



## Environment: Our Commitment

We're committed to continuous improvement as we reduce the environmental impact of our vehicles and facilities. Our culture of environmental responsibility makes us think creatively, consistently innovate, and be leaner and more efficient.

### Waste Reduction

We strive to be the automotive industry's waste reduction leader.

### Energy Efficiency

We strive to reduce emissions & petroleum dependence by being more energy efficient.

### Resource Preservation

We help preserve natural resources and enhance habitats surrounding our facilities.

### Greener Vehicles

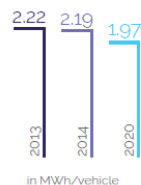
We're building fuel-efficient vehicles that fit our customers' needs and lifestyles.



COMMITMENT 1:

↓ **20%**

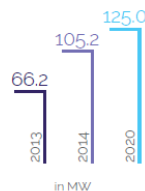
Reduce energy intensity from facilities by 20 percent.



COMMITMENT 2:

**125** MW

Promote global renewable energy use to utilize 125 MW of renewable energy by 2020.



COMMITMENT 3:

↓ **20%**

Reduce carbon intensity from facilities by 20 percent.



COMMITMENT 4:

↓ **10%**

Reduce VOC emissions from assembly painting operations by 10 percent.

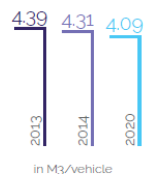
Commitment achieved in 2013.



COMMITMENT 5:

↓ **15%**

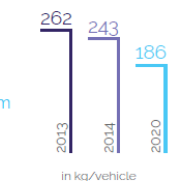
Protect water quality and reduce water intensity by 15 percent.



COMMITMENT 6:

↓ **40%**

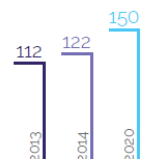
Reduce total waste from facilities worldwide by 40 percent.



COMMITMENT 7:

**150**

Promote landfill-free sites to achieve 100 landfill-free manufacturing sites and 50 nonmanufacturing sites.



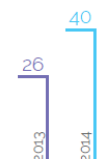
COMMITMENT 8:

**100%**

Promote and engage community outreach on environmental and energy issues by completing one outreach activity at all plants on an annual basis.

COMMITMENT 9:

Improve wildlife habitats by having a Wildlife Habitat Certification (or equivalent) at each GM manufacturing site where feasible by 2020.



For full data going back to our 2010 baseline year, please see [gmsustainability.com/data/environmental.php](http://gmsustainability.com/data/environmental.php)





**We strive to be the  
automotive industry's  
waste reduction leader.**



**Reduce**



**Reuse**



**Recycle**



# Worldwide Waste Reduction

*We recycle more waste than any other automaker*

**84%**

**MANUFACTURING  
WASTE RECYCLED**



total waste reduction  
from 2000-2010



total waste reduced  
from 2010-2013

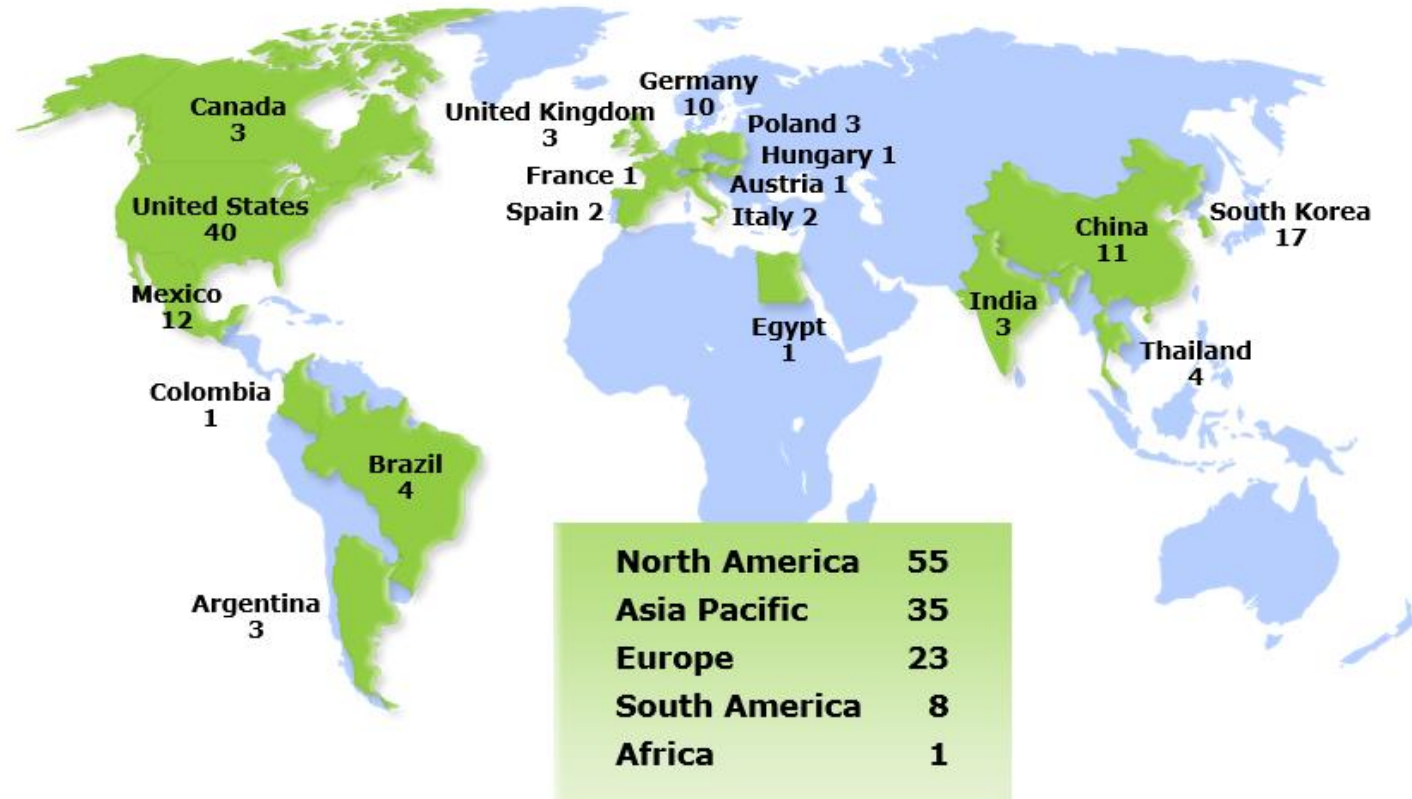


of non-recycled waste  
reduced since 2000



# 122 Landfill-Free Facilities

*No other manufacturer has as many facilities contributing zero waste to landfill*



**89** MANUFACTURING OPERATIONS

**33** NON-MANUFACTURING OPERATIONS



# Re-Use of Automotive Byproducts



**Buick Verano**  
Recycled cardboard  
used in headliner



**GMC Sierra**  
Plastic caps and  
shipping aids used  
in radiator shrouds



**Chevrolet Volt**  
Old tires used in air  
and water baffles





# Coats for Homeless with Vehicle Scrap

**4,000 yards** of sound absorption material donated from production of Malibu and Verano sedans



## Insulates 800

Empowerment Plan coats that transform into sleeping bags for the homeless.



# Volt Battery Cases Benefit Wildlife

- **700** scrap Volt battery covers repurposed into wildlife nesting boxes
- Provides safe place to lay eggs
- Alternative use for thermoset, glass filled commodity





**We strive to reduce emissions and petroleum dependence by being more energy efficient.**



**Reduce  
Use**



**Renewable  
Energy**



**Reduce  
Emissions**



# Energy Use Reduction at Global Facilities

**28%**

FROM 2005 – 2010

**3.34 M**

METRIC TONS  
GREENHOUSE GAS  
EMISSIONS AVOIDED



**11%**

FROM 2010 – 2014



# 2013, 2014 and 2015 EPA ENERGY STAR® Partner of the Year-Sustained Excellence



EPA's highest level of  
recognition for corporate  
energy management

## 70 Plants Met EPA Challenge for Industry

- **More** than any other company
- Avoided **\$195** million in energy costs



Equal to emissions  
from **244,000** homes





# RENEWABLE ENERGY

We believe in harnessing the power of renewable and alternative energy and we're one of the leading users in the manufacturing sector.



Solar

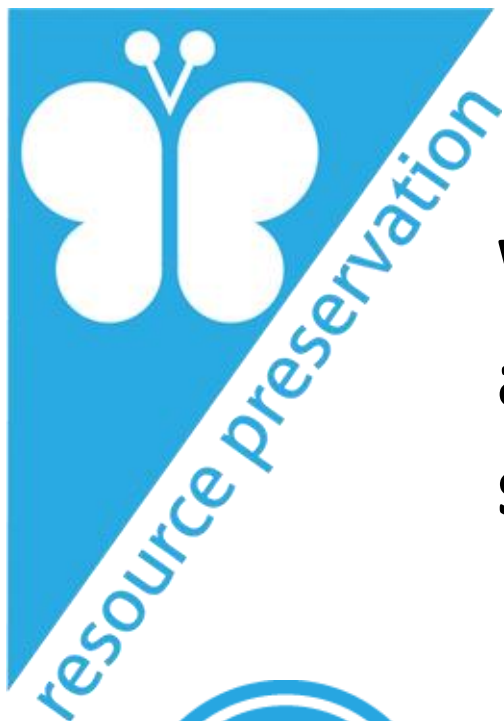


Waste to energy



Landfill Gas





**We preserve natural resources  
and enhance habitats  
surrounding our facilities.**



**Reduce  
Water Use**



**Habitat  
Enhancement**



**Watershed  
Education**



# Water Reduction at Global Facilities

**32%**

FROM 2005-2010



**11%** FROM 2010-2014



# Habitat Enhancement

**40** sites certified by:



**5,000** acres  
dedicated



# Watershed Education

## GM GREEN: Global Rivers Environmental Education Network

- 10,000 students matched with GM volunteers/year
- Supported GREEN since 1989
- Educated over 150,000 students
- In 53 communities







## GM Named to Dow Jones Sustainability Index

Only automaker recognized in North America

2015-09-11

**DETROIT** – General Motors has been named to the Dow Jones Sustainability Index, the leading global benchmark for corporate sustainability. GM is the only automaker to make the list in North America.

Launched in 1999, the Dow Jones Sustainability Indices annually assess companies for environmental, economic and social sustainability performance and disclosure. The sustainability investment firm RobecoSAM identifies companies best equipped for long-term success measured against sustainability risks and opportunities.

More than 1,800 global companies were analyzed this year. GM received top scores in climate strategy and operational eco-efficiency, and a perfect score in environmental policy and management.

"We're on a mission to transform transportation, from designing more efficient vehicles to redefining how they're built to reduce environmental impact," said Greg Martin, executive director of Global Public Policy. "These efforts allow us to deliver top-line vehicles to customers and bottom-line benefits to investors."

GM generated \$2.5 billion in revenue through various recycling activities from 2007 to 2010 and now counts about \$1 billion in byproduct reuse and recycling revenue annually. The company has saved more than \$196 million in energy costs through the voluntary [energy-reduction](#) challenge set by the U.S. EPA and \$70 million in renewable energy investments.

Earlier this year, GM [earned](#) 2015 ENERGY STAR® Partner of the Year award for Sustained Excellence, the highest recognition a corporation can receive from the Environmental Protection Agency for superior energy efficiency.

In July, GM joined a dozen other companies to launch the White House's [American Business Act on Climate Pledge](#), a commitment to address climate change through \$140 billion in new low-carbon investments and more than 1,600 megawatts of new renewable energy collectively.

For more information on GM's [environmental commitment](#), visit its [sustainability report](#) and [environmental blog](#).

**General Motors Co.** (NYSE:GM, TSX: GMM) and its partners produce vehicles in 30 countries, and the company has leadership positions in the world's largest and fastest-growing automotive markets. GM, its subsidiaries and joint venture entities sell vehicles under the Chevrolet, Cadillac, Baojun, Buick, GMC, Holden, Jiefang, Opel, Vauxhall and Wuling brands. More information on the company and its subsidiaries, including OnStar, a global leader in vehicle safety, security and information services, can be found at <http://www.gm.com>.

MEMBER OF

# Dow Jones Sustainability Indices

In Collaboration with RobecoSAM 

## 1<sup>st</sup> North American Automotive Company to become a Member



# GM Components Holdings Kokomo



# 2015 – 2016 Goal

- Reduce waste ratio by 5% as expressed in pounds of waste generated per hour
  - Waste includes recyclable materials
  - Special event waste, such as demolition or construction is not included
- By mass, most waste is related to packaging



# Adhesive Dispense System

- Improving yield of adhesive dispense system
  - The process formerly left up to 25% of material in the original container
  - Projected to show an annual material savings in the hundreds of thousands of dollars
  - Other benefits to the plant include less material handling and less down time



# Other Projects

- Solder Recovery

- We have added two EVS solder recovery units for lead free wave solder machines
- This should result in:
  - Savings in solder purchases
  - Using more of the solder purchased and lessening the need to send material for recycling

- Packaging

- We are working with suppliers to encourage more use of returnable packaging
  - Challenges involve the need for suppliers to protect electronic components during shipping and many operations use chemicals supplied in small containers



# Wildlife Habitat Certification

## Pollinator Garden





# GM Marion



# LED Project

- Removal of approximately **2,504** lighting fixtures.
- Upgrade approximately **2,191** fixtures to LED. Reducing wattage from **1086** watts to **172-344** watts per fixture utilizing LED
- Incorporating occupancy sensors and dimming controls reducing time that light are on by **30%**.
- Estimated annual savings from lighting upgrade is over **\$1,048,000 /yr.**
- KWH (Kilowatt Hours) reduced from lighting upgrade over **14,500,000 KWH's/yr.**
- Same amount of energy as **1.1 million** gallons of fuel or energy usage of **511** homes



# Compressor Upgrade

- Replaced 55 year old compressors
  - Water Cooled to Air Cooled
  - Lower Maintenance
- Eliminated 90 Ton Chiller
- Eliminated Cooling Tower
- Eliminated Pumps for cooling tower

**Reduced energy consumption by 2,365 MWH per year = \$140,000 per year**



# Recycling

- Zero Landfill 2008
- Largest Scrap Metal Recycler in GM
  - ~148,000 Tons
  - \$50 million in scrap revenue
- Closed Loop Recycling
  - Rack 1,100 tons of racks went to Defiance Foundry
  - Floor block 400,000 blocks sorted for reuse in the plant

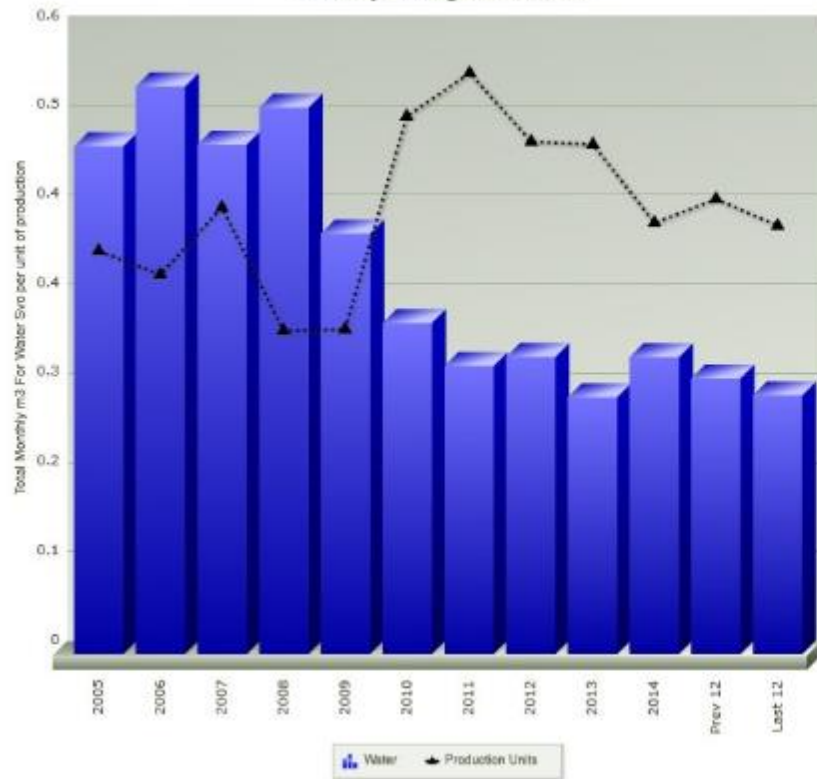


# Water Improvement from 2005-2015

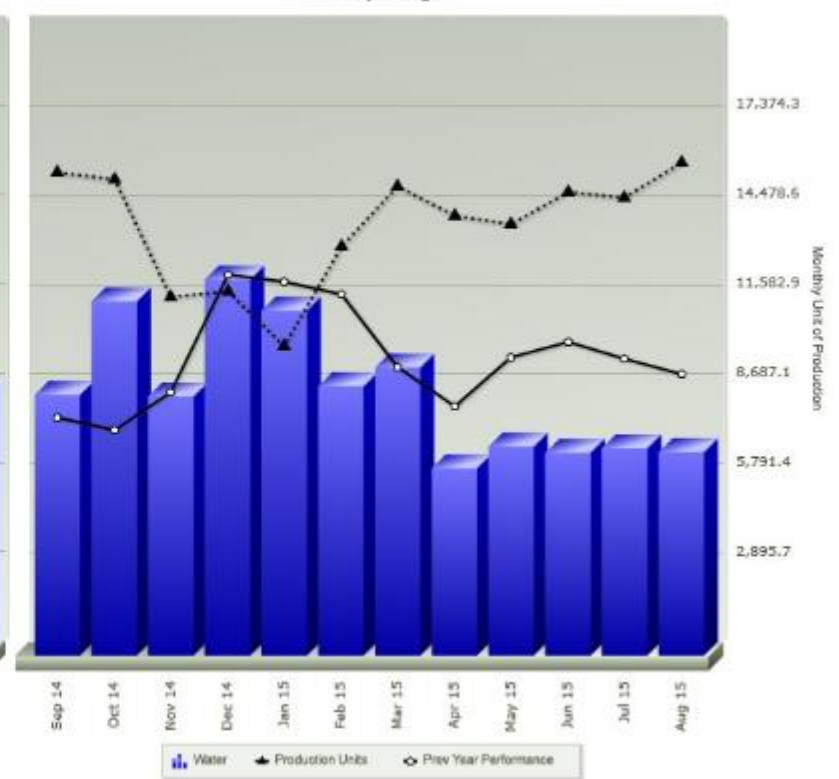
Performance since 2005 : -49.06 %

Performance since Previous 12 months : -6.21 %

Monthly Average Since 2005



Monthly Usage

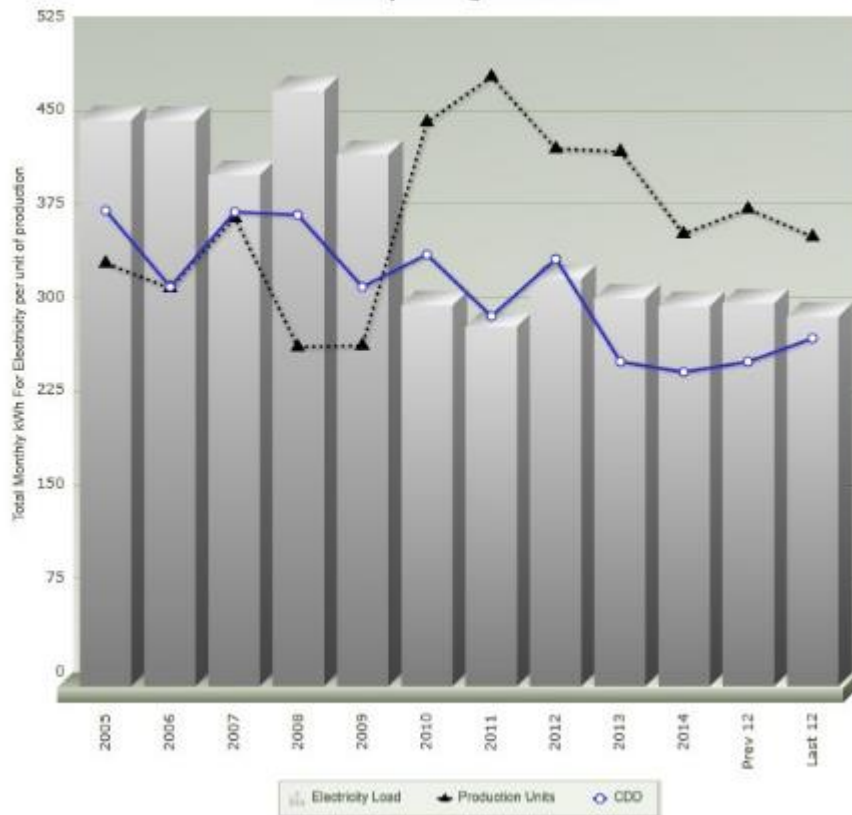


# Electrical Improvement from 2005-2015

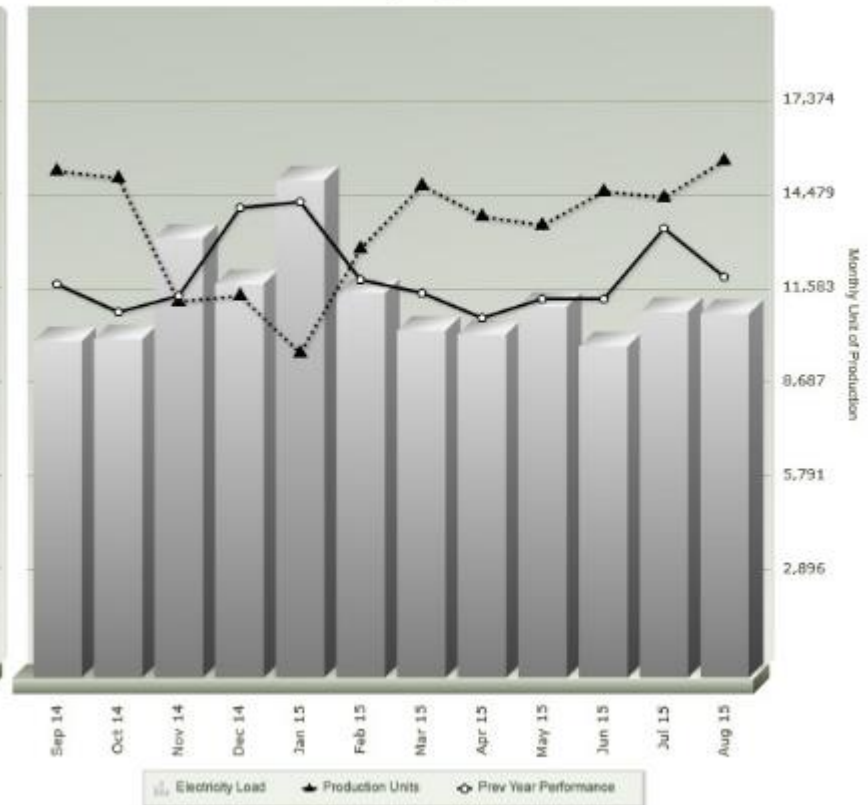
Performance since 2005 : -34.73 %

Performance since Previous 12 months : -3.50 %

Monthly Average Since 2005



Monthly Usage



# Wildlife Habitat Certification

## Wildlife Prairie

– 10 acres





# Wildlife Habitat Certification

## Butterfly Gardens

– 1.5 acre green space

